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Reply to the Paper of Stephen S. Lawrence and John A. Schreifels

We are satisfied that Lawrence and Schreifels confirm our essential result, namely, the necessity of copper for the production of crotyl alcohol. On the other hand, we have difficulties in understanding why they consider it possible that "the formation of crotyl alcohol may not be a catalytic process at all, but the result of a stoichiometric reaction with a small number of nickel sites that have the correct electronic environment and/or ensemble size to allow this reaction to take place."

Is it not the case, apart from the assumption of stoichiometry, that in a practical catalytic process the catalyst, strictly speaking, is always affected by the reaction taking place on its surface? Degradation or even complete deactivation (elimination) of the sites involved in the catalytic process is a common phenomenon. In our opinion, it will be extremely difficult to determine if there was a stoichiometric reaction with nickel, which does not appear in the product.

The catalyst used by Lawrence and Schreifels had considerably more nickel than our catalyst with the highest selectivity for crotyl alcohol (which remained constant for more than 30 h). In our experiments, we found catalysts with so high a nickel content to be very active. Thus, we could imagine that there was rapid deactivation of the few sites appropriate for the formation of crotyl alcohol.

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